



The Optical Unconscious of Big Data

Datafication of vision and care for unknown futures

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Abstract

Ever since Big Data became a *mot du jour* across social fields, optical metaphors such as the microscope began to surface in popular discourse to describe and qualify its epistemological impact. While the persistence of optics seems to be at odds with the datafication of vision, this article suggests that the optical metaphor offers an opportunity to reflect about the material consequences of the modes of seeing and knowing that currently shape datafied worlds. Drawing on feminist new materialism, the article investigates the optical metaphor as a material-discursive practice that actively constitutes the world, as metaphors imply modes of thinking, knowing and doing that have material enactions. Expanding visual culture theories, the notion of 'optical unconscious' is taken up to discuss the tensions between displacement and persistence of optics within datafied worlds, that is, how optical vision is displaced but also mobilised and repurposed by data-driven knowledge. In dialogue with feminist science and technology studies and speculative ethics, I suggest that the datafication of vision offers a chance to reconceptualize the sense of sight towards a sensorial engagement with Big Data premised on responsibility, care, and an ethics of unknowability. Within this framework, vision may be conceived differently, perhaps not only as enhancement and control, but as generator of new possibilities. Ultimately, the article proposes that the visual theories after which Big Data is being imagined matter not only for our understanding of Big Data's epistemic potential, but also for the possibility of shaping emerging data worlds.

Keywords

Optical unconscious, datafication of vision, speculative ethics, care, feminist materialism, metaphors

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Ever since Big Data became a *mot du jour* across social fields, optical metaphors such as the microscope have begun to surface in popular discourse to describe and qualify its epistemological impact. From business to healthcare, Big Data has been equalled to the 'measurement revolution' ushered in by the microscope (Herzog, 2014), compared to an optical instrument that could propel a 'new age of discovery' (Christakis et al., 2017), or even branded, more straightforwardly, as 'the microscope of the 21st century' (Higginbotham, 2011). In a documentary entitled 'The Human Face of Big Data' (2016), Jay Walker, described as a business inventor and entrepreneur, speaks enthusiastically about the 'invisible worlds' opened up by Big Data,

comparing it to the perceptual changes introduced by the microscope:

But now there's actually a super visual world that is coming into play. Ironically big data is a microscope. We're now collecting exo-bits and peda-bites of data

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and we're looking through that microscope using incredibly powerful algorithms to see what we would never see before. (Walker in PBS, 2016, emphasis added)

These are but a few examples of numerous visual and optical metaphors in place to describe Big Data. I transcribe this last one as the phrasing most directly conflates the microscope of the past with the algorithms used in the present to sort information and thereby reveal a 'super visual world'. Big Data here offers a promise of enhanced knowledge, which amounts to seeing more than ever before. As a visual culture scholar, I am struck by the surfacing of the ocular in the social imagination of Big Data, and its implications for how we perceive and understand the epistemological potential of large scale information. Why does the metaphor of the lens emerge at this point? And what is at stake in imagining Big Data through optics?

This reliance on optical metaphors is particularly curious if we think of how vision is increasingly datafied, a shift that I term here datafication of vision. Datafication has been broadly defined as the process through which human activities are converted to data which can then be mobilised for different purposes (Flyverbom and Murray, 2018; Mayer-Schönberger and Cukier, 2013). Drawing on this understanding, datafication of vision points towards a set of phenomena whereby the visual world is increasingly rendered through and as data. Machine vision is one example, whereby machines convert that which humans can see into data to be treated by algorithms, thus amplifying the capacities of human vision. Take for instance the billions of images uploaded daily to Facebook, which are processed by algorithms far more than they will ever be seen by humans. Machine vision occurs through data, not optical means, and through datafication, vision becomes essentially post-optical (Kane, 2014; Rettberg, 2017). The pervasiveness of data visualization as a genre is another noticeable example. Data visualization implies an apprehension of the social world through datafied modes of knowledge production that are then translated into visual form, but this process of translation remains absent from the final visualization (Drucker, 2017; Galloway, 2011). A consequence of this process is that data visualization largely reinscribes the figure of the omniscient, autonomous subject placed in an observer-independent relation to knowledge (Drucker, 2017).² So while there is a shift from optics to datafication, at the same time there is a reinscription of a subject of knowledge that is consistent with modern optics-based observation. This raises a set of questions that I would like to expand on: why is it that the sense of sight, in its shift to datafication, is being mobilised and recast through the modern, un-situated observing subject who aims to render the world as

knowable through amplification of senses? Can datafication of vision be instead an opportunity to redirect the sense of sight towards a different engagement with large-scale information, perhaps an engagement premised not on efficiency and enhancement, but on dignity, ethical responsibility and care for what is not known? If datafication of vision is premised on knowing, amplifying, mastering, and controlling, might there be other models of vision available, or other modes of sensorial engagement, that can instead redirect emerging data worlds towards ethical responsibility and reciprocity between knower and known?

Rather than dismissing the optical metaphor as a mere trope to imagine the epistemological (and surely economical) potential of Big Data, I take it as an opportunity to reflect about the material consequences of the modes of seeing and knowing that currently shape datafied worlds. I thus understand metaphors to actually shape the world, as metaphors imply modes of thinking and doing that actively constitute the world that we live in, and constitute us as subjects and objects of knowledge (Barad, 2007). When I speak of metaphors I therefore do not stay just within the domain of linguistic or cultural imagination, but I am rather concerned with how the modes of thinking, knowing and doing implied by metaphors are actually constituting emerging datafied worlds. The article begins by drawing on feminist new materialism to consider the materiality of metaphors and how they come to shape knowledge practices. Expanding visual culture theories, the notion of optical unconscious of Big Data is proposed to discuss the tensions between displacement and persistence of optics within datafied worlds, that is, how optical vision is implicated, mobilised and repurposed by data-driven knowledge, even though datafication seems to do away with sight. In dialogue with feminist science and technology studies and speculative ethics, I suggest that the datafication of vision offers a chance to reconceptualize the sense of sight towards a sensorial engagement with Big Data premised on responsibility, care, and an ethics of unknowability. Ultimately, the article proposes that the visual theories after which Big Data is being imagined matter not only for our understanding of Big Data's epistemological potential, but also for the possibility of shaping emerging data worlds.

Optical metaphors and how they come to matter

Despite decades of intellectual inquiry interrogating the privilege of vision in the hierarchy of the senses and its complicity with projects of political and social control (Crary, 1992; Foucault, 1997; Haraway, 1988; hooks, 1992; Jameson, 1992; Jay, 1994; Levin, 1993; Marks,

2002; Merleau-Ponty, 1968; Mulvey, 1975; Sobchack, 1992; Winnubst, 2006), vocabularies of vision still permeate language and are often foundational in the writing of disciplines.³ Feminist historians of science Evelyn Fox Keller and Christine Grontkowski have drawn attention to the role of the visual metaphor in Western epistemology. Unnoticed, they claim, these visual tropes can inform our shared concepts of knowledge and the language in which those concepts are formulated (Keller and Grontkowski, 2004: 208). Because these formulations ‘carry assumptions which might have inadvertently crept into our conceptions of knowledge as a consequence of our reliance on the visual metaphor’ (Keller and Grontkowski, 2004: 208), it is important to inquire into the ways in which this reliance has informed the way we value specific forms of knowledge-making. Through which kind of theories of vision is Big Data socially imagined? And what kinds of epistemic models are we enabling and disabling through them?

The fact that optical metaphors can inform shared concepts and practices of knowledge suggests that metaphors, and language more broadly, have a material existence. As discussions conducted by feminist new materialisms have pointed out, this does not mean that material reality is solely produced by discourse, but rather that discursive production is embedded in material phenomena, and often ‘scripted onto material bodies’ (Alaimo and Hekman, 2008: 9). Karen Barad in particular has drawn attention to material-discursive ‘intra-actions’, that is, to how discursivity and materiality are not independent realms that refer to one another, but actively shape and make each other through mutual, ‘intra-active becoming’. In other words, practices are constituted by both discourses and materialities:

The relationship between the material and the discursive is one of mutual entailment. Neither discursive practices nor material phenomena are ontologically or epistemologically prior. Neither can be explained in terms of the other. Neither is reducible to the other. Neither has privileged status in determining the other. Neither is articulated or articulable in the absence of the other; matter and meaning are mutually articulated. (Barad, 2007: 152)

From this follows that discourse does not exist without being materialized in some form, that is, meanings are materially enacted in practice (Orlikowski and Scott, 2015). This understanding underlies Barad’s account of performativity, which shifts the focus from representationalism and ‘questions of correspondence between descriptions and reality (e.g., do they mirror nature or culture?) to matters of practices/doings/actions’ (Barad, 2003: 802). Material-discursive practices are rather constitutive, they are performative, they make different

worlds. They thus effect ‘real consequences, interventions, creative possibilities, and responsibilities of intra-acting within and as part of the world’ (Barad, 2007: 37).

Take again the example of machine vision. One could say that the ‘vision’ in machine vision is also a metaphor, insofar as machines do not see in the same way as humans do. In literary studies one would call this ‘catachresis’, an example of which would be the ‘legs’ of a table. But machinic vision ceases to be metaphorical as it becomes a practice that permeates social life, from facial recognition algorithms used by Facebook to those used by bank security systems to safely identify individuals (Rettberg, 2017), to a point where the visual sense needs to be (or is already being) reconceptualized, or at least contend with the fact that humans and animals are no longer the only beings that see. Machine vision offers the promise of enhancing human vision, of seeing more and differently, similarly to the microscope or the telescope. While seemingly metaphorical, the vision in machine vision actually reshapes what it means to see, it makes a different world. Machine vision is a material-discursive practice that implies historical modes of seeing that emerge from joint developments in science as well as in disciplinary and control societies. As a material-discursive practice, it is indebted to discourses about seeing and being seen, and material enactions such as facial recognition that extend and refashion such discourses. I thus draw a connection between the metaphorical imagination of Big Data writ large and the specific processes implied by datafication of vision to argue that the two are co-constitutive: the fact that Big Data is imagined through optical metaphors is part of the same phenomenon through which machines acquire – and thereby reshape – vision. Big Data is imagined as a microscope because the modes of seeing implied by the microscope – enhancement of the senses and heightened knowability – are already being materially mobilized into datafied modes of knowledge production such as machine vision. The optical and the post-optical make each other. This is why it matters to attend to notions of seeing implied by optical metaphors, as these metaphors are performed into being. This is also why it matters to think about, conceive and emphasize other modes of seeing and sensing, as they can be enacted towards different practices and engagements with data, as ‘practices always have the potential to perform something different’ (Scott and Orlikowski, 2014: 878). I shall return to this question in the last section of the article.

Treating material-discursive practices as performative thus entails ‘tracing the genealogy of practices that have enacted certain phenomena over time so as to understand how particular distinctions, boundaries

and properties have been historically produced, stabilized and destabilized' (Czarniawska, 2016: 93). Metaphors often gesture towards genealogies that become naturalized through actual practices. With this in mind, I shall now turn my attention to the genealogy of displacement and persistence of optics in Big Data through the notion of 'optical unconscious'.

Big Data's optical unconscious

While vision, through datafication, has become essentially post-optical (Kane, 2014), discourses on Big Data still rely on optical metaphors to make sense of changing practices in the treatment of large-scale information, which suggests that opticality and the modes of observation it generated still shape the way datafication is coming into being. I propose that the optical metaphor can be read as a symptom of an 'optical unconscious' that continues to haunt contemporary datafied modes of knowledge production. While this optical persistence does not mean that vision still operates in the same ways, it does point towards the need to pay attention to remnants of optical epistemes that continue in play. This means that optical metaphors are not only an easy, perhaps comforting way to convey the complexity of large-scale information to lay people. What I suggest is that modern modes of observation that came into fruition through optics (for instance, the promise of enhancing the senses) are still at work in the datafication of vision. Through datafication, optics is both displaced and reinstated.

While the billions of images uploaded daily to Facebook are certainly read by algorithms far more than they will ever be seen by humans, it is also true that those images are often screened by humans working for content moderation companies outsourced by Facebook, and that this invisibilized and often low-paid labour complicates the notion of machine-to-machine vision (Roberts, 2018). At the same time, these billions of images meant to be read by machines also emerge from (and are read within) a limited set of representational possibilities, such as a racially saturated field of visibility or prescribed modes of gendered behaviour (Alexander, 1994; Browne, 2015; Butler, 1993; Chun and Friedland, 2015; Keeling, 2005) that run deeper than the often criticised datasets in machine learning. This means that, even though datafication seems to do away with the field of vision as we know it, in fact older modes of visual engagement are still very much in function, but have moved further beyond the threshold of human perception. Overemphasizing the paradigm shift of machinic vision thus runs the risk of overlooking ideologies and structural inequalities (of seeing and being seen) that are already hardwired into the datafication of vision.

The notion of 'optical unconscious' that I take up here was introduced by German cultural theorist Walter Benjamin in his writings about technology, in particular in his essay 'Little History of Photography', where he proposes that photography as a visual technology offered unprecedented access to hitherto unnoticed phenomena, either too minuscule or too rapid for the unaided human eye to see (Benjamin, 1999 [1931]). In his essay on the 'Work of Art in the Age of Mechanical Reproduction', Benjamin goes on to propose that slow motion and close-ups open 'a vast and unsuspected field of action... And just as enlargement not merely clarifies what we see indistinctly "in any case", but brings to light entirely new structures of matter' (Benjamin, 2008 [1936]: 37). In both essays, Benjamin claims that the camera enables the discovery of the optical unconscious, just as psychoanalysis enabled the discovery of the instinctual unconscious.⁴

Yet, quite unlike the fantasies of knowledge conveyed by optical metaphors such as the microscope, and the 'super visual worlds' enabled by them, the lens-based medium in Benjamin's writings always challenges the fantasy of mastery that couches the desire to see and to know. While he did marvel at the perceptual enhancement of material reality, he also emphasized how these media affected and changed the reality it offers unprecedented access to. As Smith and Sliwinski put it, his

consideration of the optical unconscious attunes us to all that is not consciously controlled in the making, circulation, and viewing of photographs, the contingency involved in the production and consumption of images, as well as the unexamined motivations and effects of this technology's pervasive spread into wider and wider spheres of human and nonhuman activity. (Smith and Sliwinski, 2017: 2)

Indeed, Benjamin noted early on that photography was being widely adopted by everyday users and applied to manifold domains of social life, what we today term ubiquitous photography (Kember, 2012). But while he recognized the increased pervasiveness of lens-based media such as photography and later film, he never ceased to emphasize the blind spots that these technologies open up, alongside the new structures of matter they reveal. In other words, Benjamin pointed towards how the lens-based medium opened up spaces of unknowability, rather than just new opportunities for control and mastery.

Taking the cue from Benjamin, I ask whether we can take the optical unconscious at play in Big Data, not as a model that extends to Big Data the fantasies of control and mastery offered by modern optics, but as a material-discursive practice that opens up space for

the unknown and unknowability. I thus see the optical metaphor as an opportunity to reclaim vision, to re-route it from current and emerging regimes of datafied calculation that extend the project of modern objective observation. Can we cultivate the unknown of the optical unconscious, instead of the new opportunities for control?

In her plea for situated knowledge and a feminist doctrine of objectivity, Haraway also made a case for taking metaphors seriously by positing the need to metaphorically emphasize the sense of vision again, in order to reclaim it from the powers of modern scientific objectivity. Precisely because the sense of vision has been instrumentalized to distance the knowing subject from the world, and to purge the marked body from all elements of subjectivity, Haraway foregrounded the need to reclaim it in different terms, terms that insist on the ‘particularity and embodiment of all vision’ (Haraway, 1988: 582). So instead of using the optical metaphor to endorse what she terms the views from nowhere or anywhere, the optical can be repurposed to investigate the apparatuses of visual production as ‘technologies of positioning’, the conditions of visibility they give rise to, the kind of subjects they produce, and the regimes of knowledge they enable or disable. The optical metaphor can be recast to ask a different set of questions:

How to see? Where to see from? What limits to vision? What to see for? Who to see with? Who gets to have more than one point of view? Who gets blinded? Who wears blinders? Who interprets the visual field? What other sensory powers do we wish to cultivate besides vision? (Haraway, 1988: 587)

The question that needs to be formulated is then, how to reconceive of vision to move beyond instrumental datafication, implied by data visualization and machine vision, but also the employment of Big Data for control and profit more broadly? What kind of vision(s) can be harnessed towards an ethics of unknowability? In the final section of this article, I explore these questions by engaging with recent discussions in feminist science and technology studies revolving around speculative ethics and care for the unknown. As a mode of thinking about the possible and the future that is concerned with provoking political and ethical imagination in the present (rather than predictions or preemptions), speculative ethics offers a space for articulating possibilities and opening up ways of understanding and transforming in the world. These imaginations wish to move beyond the promise of prediction and control of unknown futures towards an engagement with possibilities that are beyond the scope of tangible knowledge, in ways that are ‘responsive and with care’ (Pink et al.,

2018). Within this framework, vision may then be conceived differently, perhaps not only as an instrument of sensorial enhancement, calculation and control, but as generator of new possibilities, or at least a site where this openness to the unknown can be articulated. While admittedly exploratory and non-programmatic, these final considerations are offered as a potential opening to think datafied vision otherwise, guided by Barad’s suggestion that discursive-material practices can generate ‘real consequences, interventions, creative possibilities, and responsibilities of intra-acting within and as part of the world’ (Barad, 2007: 37).

Touching visions for datafied worlds

In her book *Matters of Care*, Maria Puig de la Bellacasa explores and expands the meanings of care for thinking and living in more than human worlds. While care can be understood as a human ethico-political obligation, she argues that it does not mean that it is a human-only matter. The scope of Bellacasa’s reflection revolves around naturecultures, but the questions she raises are worth expanding to think about datafied worlds. Taking her questions further, we could ask: in order to move beyond datafication as calculation and prediction, can we think of care as an ethico-political obligation that also extends to the unknowns contained in datafied worlds? Here I am reminded of Wendy Chun’s remarks towards the end of ‘Crisis, Crisis, Crisis, or Sovereignty and Networks’, where she claims that rather than complaining about the fallibility of predictive technologies, we need to care for them, and ‘frame their predictions as calls for responsibility’ (Chun, 2011: 160). The point of their predictive capacity, she posits, is to persuade us to not let that potential future come to fruition. It is precisely in this gap between these future predictions and the future materializations that a care ethics with and for data needs to be formulated.

Chun’s call for care and responsibility resonates with Bellacasa’s proposition of a speculative ethics in more than human worlds, as a mode of thought about the possible that is concerned with provoking political and ethical imagination in the present, that is, in the gap between predicted and materialized futures. This political imagination of the possible is fundamentally concerned with crafting visions of other worlds with awareness, care and responsibility for what is not yet known. Such a call is consistent with what Astrida Neimanis terms ‘an ethics of unknowability’, a position that emphasizes care towards the incalculable:

The future is always an open question, and our bodies must be understood as flowing beyond the bounds of what is knowable. [...] On this ‘ever-changing landscape of continuous interplay, intra-action, emergence, and

risk', even as we insist upon accountability, we must also make decisions that eschew certainty and necessary courses of action. This is an ethics of unknowability. (Neimanis, 2012: 109–110)

To cultivate such an ethics of unknowability requires us to redirect vision away from calculation towards care for unknown futures.

The question of care can be brought together with the problem of vision discussed earlier insofar as both care and vision can be entangled with hegemonic regimes but also reclaimed for transformative orientations. In this sense, within a speculative mode of thinking, both vision and care can be conceived as generators of new possibilities or sites of transformation. Feminist theory has long pointed out that care is not an uncontested notion or practice, bound as it is with histories of non-care and neglect, the violence of interdependence, the essentialization of women's experience, uneven allocation, paternalistic orientations in institutionalized settings or the complicity with colonizing projects (Baraitser, 2017; Murphy, 2015; Tronto, 2010). Under neoliberal governance, the political potential of care as a 'category of feminist organizing' (Sharma, 2018) has been co-opted to become a pervasive order of individualized biopolitics, while its institutionalization has devalued the concept of care, which is seen as synonym with dependency and disempowerment. Within feminist ethics of care, there is a sense that care needs to be reclaimed both from idealized conceptions (care as a loving and feminine task separate from politics) and denigrating meanings. The transformation that care ethics seeks is that care thinking (or thinking with care) will impact on the way we think about politics and the way political action is conceived and enacted through mutual responsibility (Tronto, 2013). This thinking with care, I suggest, calls for, and runs parallel to, a different conceptualization of the sense of sight invested in the speculative imagination of possible worlds. In other words, how to cultivate visions with care for the unknown futures, instead of attempts to predict, preempt and capitalize the future?

Related to the sense of sight, the speculative is traditionally associated with vision and observation. But the notion of speculative vision can also suggest a detachment from material conditions, as in the expression 'pure speculation'. Here the potential of the speculative is marred by the history of scientific observation and objectivity that tended to favour a disembodied engagement with the material world, views from nowhere and anywhere to use Haraway's terms. This fraught history of observation led to calls across different disciplines, not least in the field of visual culture, to counter ocular-centric bias and pay attention to other dimensions of sensorial experience (Classen, 2012; Marks, 2002; Howes, 2003; Parisi and Archer, 2017; Pink, 2015;

Sobchack, 1992). This 'sensuous scholarship' (Stoller, 1997) has also become particularly relevant within critical data studies due to the wide embodied spectrum of data effects, from sensing to tracking and measuring, whereby bodies and data are differently co-constituted through various senses in contemporary datafied worlds (Kaziunas et al., 2017; Lupton, 2017). Because our interactions or intra-actions with data occur not only through sight, but also through touch and sound, the hand and the voice, the place of the living body in data gathering and processing operations is being increasingly explored, both empirically and theoretically. And since the body generates an immense variety of data, from health monitoring to security scanings and voice recognition, an exclusive focus on the visual can be said to occlude this bodily investment into and by data. Now more than ever, processes of datafication, as M el Hogan puts it, operate through the flesh – 'the individual flesh and the flesh of the world' (Hogan, 2018). Such realisations invite us to probe further into the kinds of embodied experiences these encounters between human bodies, data and other involved agents elicit or generate.

Responding to such sensory developments, Bellacasa proposes to turn to touch as a sensorial universe that might provide the conditions for an ethics of care to be formulated, as touch offers the promise to overcome the disengaged distance associated with knowledge-as-vision (Bellacasa, 2017: 95–112). Yet, she cautions against the potential pitfalls of touch: because touch shortens distance, it can also misguide us into conflating touch with immediacy and authentic connection to the real, or to substitute claims of transparent and unpolluted observation with desires of '*direct* and extended accelerated *efficient* intervention' through touch. She posits that touch cannot be presumed to improve caring per se, nor to necessarily challenging oppressive configurations (Bellacasa, 2017: 112).

These reservations towards the haptic as a sense more ethically attuned or politically significant are amplified by the proliferation of embedded technologies that increasingly merge bodies with data, wherein the need for the sense of touch apparently disappears, making it even more difficult to pinpoint the senses that mediate our encounter with data. One could add that touch, too, has long been part of the history of violence and control that informs current datafied practices of surveillance for instance (Browne, 2015). So if touch does not necessarily overcome the shortcomings of sight, and in fact may even reproduce and entrench them through haptic configurations, what kinds of sensorial arrangements could emphasize an ethical awareness regarding the material consequences of datafied knowledge?

Inspired by Haraway's plea to reclaim the sense of vision, Bellacasa proposes to engage with touch to

reclaim vision through what she terms ‘touching visions’. Refusing the distinction between vision and touch, and the divide between distanced objective vision and subjective, embodied contact, she foregrounds ‘touching visions’ as sensorial engagements that foreground a desire for tangible relations and grounded transformations, rather than perceptual or sensorial enhancement. Though there are indeed many things that knowledge-as-distant vision fails to feel, vision can also challenge the idealization of closeness and the superiority of knowledge in proximity. Aware of the possible perils of touch, these visions do not seek a hold on reality through ‘improved grasp’, but a relatedness with material reality through care and an ethical awareness about material consequences. Rather than opening up ‘super visual worlds’, or mastering the unseen and the unknown, a recognition of mutual vulnerability is the ultimate desideratum of ‘touching visions’. Touching is not here a promise of enhanced and privileged contact with reality but rather an invitation to attune to its neglected perceptions.

Karen Barad’s account of the scanning tunnelling microscope can be taken as a touching-vision proposition. According to Barad, these microscopes, used to scan surfaces at atomic level, function through ‘very different physical principles than visual sight’ (Barad, 2007: 53). Her account of the scanning tunnelling microscope describes an encounter with the atomic world that engages the sense of touch rather than sight, where the microscope is not used solely to view atoms ‘but to pick them and move them’ (Barad, 2007: 50). Rather than visualizing atomic reality, this technology scans and ‘feels’ the surface through a microscope tip that is maneuvered across the surface of the specimen being imaged. Here there is no separation between observing and touching; through this technology, vision is not separate from direct material engagement, from being in relation with the physical world. Vision as touch thus appears as a sensorial entanglement of multiple materialities whereby not only the microscope touches the surface, but the surface also has an effect on the mediating device of touching vision (Bellacasa, 2017: 114).

Taking this proposition further, one could argue that this notion of ‘touching vision’ acknowledges the sensorial entanglements already inherent to, and activated by, each one of the senses. Within visual culture theory, the visual is not necessarily conflated with optical faculties, but rather taken as an analytical focus that ‘also compels attention to the tactile, the auditory, the haptic, and the phenomenon of synesthesia’ (Mitchell, 2002: 170). As film theorist Vivian Sobchack reminds us, as lived bodies, ‘our vision is always already fleshed out’ (Sobchack, 2004: 60). Phenomenologically, vision is always haptic, as eyes refract waves sensed by the cornea, signals that touch us. But more than this,

visual perception, our sense of visual recognition of things, is always informed by a broader sensory engagement with material reality, the same way the sense of sight solicits the other senses in its encounter with the world. At the same time, touch is not to be merely equated with physical contact, but understood more broadly as a mode of being in the world through which the body presents itself to the world and through which it perceives that world as sensible (Barker, 2009: 2). The hapticality implicit in ‘touching visions’ may more aptly be understood as feeling through others, with feeling standing not only for a tactile mode of sensing the world, but also – and more ethically significantly – as a mode of engagement with and through other beings in the world.

Touching visions thus draw attention to the possibility of touching and being touched by what we observe, and what observes us. And here I would like to recapture the etymology of observation to make a final point about the importance of attending to the visual models through which we encounter the world. In *Techniques of the Observer*, Jonathan Crary submits that to observe, more than looking at, means to conform one’s actions, to comply with, ‘as in observing rules, codes, regulations and practices. Though obviously one who sees, an observer is more importantly one who sees with a prescribed set of possibilities, one who is embedded in a system of conventions and limitations’ (Crary, 1992: 6). While Crary is concerned here with the formation of the modern viewing subject, and the disciplining techniques that this subject is constituted by, there is also a notion of compliance and adherence that can be differently explored. What if we retain the idea of observance and obligation contained in observation but redirect it towards a practice of care? Implicit in observance is also a practice of respect, as in observing a custom, a ritual, a holiday, to act in acknowledgment out of respect for something or someone. More than complying with a prescription or a rule that compels us to observe, observance is a practice of paying attention and caring for others, not just following a rule, but giving proper heed to, an engagement with others, also unknown others. Observance thus also solicits a collective imagining, a collective act of accordance with a ritual that is not about following a prescribed set of customs but to gather around an act of care towards something. This notion of observance beyond prescription, as deliberate act of care, challenges the alleged passivity or the desire to master which observation is still conflated with. It also conjures a notion of care that is not bound with a moral obligation but with acknowledgement and responsibility, of reciprocal obligation to others, observing as feeling through others (Ahmed, 2010). Observance can thus be seen as a practice of touching vision, a model of vision that goes beyond mastery or enhancement of

knowledge towards a collective call for responsibility, of engagement with others with a sense of awareness and care for unknown futures.

With this article I sought to argue that what might be seen as an anachronistic persistence of the optical in the imagination of Big Data can be taken as a call to investigate the persistence of opticality in data practices, as well as to reconceptualize inherited meanings of vision. What I have termed the optical unconscious of Big Data – whereby the sense of sight is both displaced and mobilised by data – thus draws attention to entrenched modes of knowledge that find their way into current and emerging epistemic fields. The optical unconscious is therefore indicative of an opticality that is encoded into the datafication of vision, and which extends, through datafied means, modes of observation and subject positions privileged by modern optics. Yet, I also argue that this opticality invites for a reconsideration of the theories of vision that Big Data is being informed by. Through a speculative mode of thinking, we might reimagine the microscope of Big Data as a scanning tunnelling microscope, one that does not separate seeing from touching, where vision is not separate from direct material engagement, and where knower and known cannot be considered apart. We might then redirect the sense of sight currently invested in the imagination of Big Data towards a mode of sensorial engagement that is concerned with crafting visions of other worlds with care and responsibility for unknown futures. While I suggest that collective imaginations of Big Data must be aware of the historical models that continue to haunt our relation to the technological present, I have also tried to open up the discussion to other modes of thinking about vision that foster other ways of sensing and inhabiting the possible. With these reflections I hope to contribute to an enrichment of the meanings of vision in a way that invites others to consider further sensorial and ethical engagements in emerging datafied worlds.

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Notes

1. I also acknowledge the work of many scholars and creative practitioners who push the boundaries of the genre of data visualization towards critical, decolonial and sensorially expanded modes of observation (Brown, 2015; D'Ignazio and Klein, 2016; Mackenzie et al., 2017).
2. The Social Media Collective has gathered a reading list of academic and popular writing on metaphors of data, ranging from 'data as the new oil' to data as sweat (Gregg, 2015), data as cloud (Peters, 2015), data as ocean (Lupton, 2013), among others. See <https://socialmediacollective.org/reading-lists/metaphors-of-data-a-reading-list/>.
3. Although it engages with Freud's (1953) psychoanalytic notion of the unconscious, Benjamin's notion of 'optical unconscious' departs from it by focusing on the perceptual enhancement of reality brought about by the technological media of the time, such as photography and cinema, and the revolutionary potential contained in this enhancement. For a detailed reading of Benjamin's and Freud's different interpretations of the unconscious see Smith (2013).

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